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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

SOCIETY AFFAIRS

CONTENTS

MINUTES OF MEETINGS OF THE SOCIETY

September 3d, 1913.—The meeting was called to order at 8.30 P. M.; Vice-President J. Waldo Smith in the chair; Charles Warren Hunt, Secretary; and present, also, 121 members and 15 guests.

The minutes of the meetings of May 21st, June 4th, and of the Annual Convention, were approved as printed in *Proceedings* for August, 1913.

A paper by A. M. Strong, Assoc. M. Am. Soc. C. E., entitled "The Storage of Flood Waters for Irrigation: A Study of the Supply Available from Southern California Streams," was presented by title and the Secretary read a communication on the subject from Charles H. Lee, Assoc. M. Am. Soc. C. E.

A paper by Charles W. Staniford, M. Am. Soc. C. E., entitled "Modern Pier Construction in New York Harbor," was presented by title, and communications on the subject, from Messrs. E. G. Walker, Edwin J. Beugler, and Harrison S. Taft, were read by the Secretary. The paper was discussed orally by Messrs. F. R. Harris, S. M. Purdy,

B. H. Wait, L. D. Cornish, F. Lavis, J. P. Snow, F. A. Snyder, R. T. Betts, T. B. Shertzer, and C. H. Stengel.

The Secretary announced the election of the following candidates on September 3d, 1913:

As Members

John William Craig, Baltimore, Md.
Arthur Crumpton, Port Hope, Ont., Canada
John Samuel Eastwood, San Francisco, Cal.
John Morrice Roger Fairbairn, Westmount, Que., Canada
Horace Williams King, Ann Arbor, Mich.
John Hancock Lance, Wilkes-Barre, Pa.
William Junius Lester, Pueblo, Colo.
Walter Huntley Mansfield, Troy, N. Y.
Harry Alonzo Noble, Berkeley, Cal.
Frank Louis Raschig, Cincinnati, Ohio
Edward Manly Royall, Jr., Charleston, S. C.
Robert Carlos Sattley, Chicago, Ill.
William Stanton Twining, New York City

As Associate Members

James Perrie Alvey, Jr., Chicago, Ill.
Bertrand Don Barker, Chicago, Ill.
Joseph L Burkholder, Parma, Idaho
Alfred John Cleary, San Francisco, Cal.
Frederick George Cross, Bassano, Alberta, Canada
Edwin Sanford Cullings, Albany, N. Y.
David Hesba Dugan, Chillicothe, Ill.
Conrad Francis Dykeman, Brooklyn, N. Y.
Gwynne Wallace Ellis, Kansas City, Mo.
Morris Cable Emanuel, Fort Smith, Ark.
Thomas Willard Espy, San Francisco, Cal.
Ozro Nowlin Floyd, Dayton, Ohio
Francis Eugene Freeland, Nashville, Tenn.
Ralph Lyman Harding, Manila, Philippine Islands
Floyd Sinnock Hewes, Winslow, Ariz.
Luther Romberger Hoffman, Detroit, Mich.
William Whitehead Hurlbut, Los Angeles, Cal.
Joseph Frederick Jackson, New Haven, Conn.
Lebrecht Julius Klug, Milwaukee, Wis.
Herman Charles Kuhl, Fort Shaw, Mont.
Lauritz Lauritzen, San Francisco, Cal.
Egbert Vanhorn Lawrence, New York City
George Thomas McClean, Fort Stevens, Ore.
George Earle McCurdy, Glen Ellyn, Ill.
Evan Search Martin, New York City

Charles Rea Moore, Perry, Wash.
Leroy Norman Reeve, Arrowrock, Idaho
Roy Karl Schlafly, Columbus, Ohio
John Joseph Henry Sharon, San Francisco, Cal.
Adolphus Gustavus Trost, El Paso, Tex.
Isaac Stanley Walker, Brooklyn, N. Y.
William Kemp Walker, Wichita, Kans.
Roscoe George Walter, Prairie du Sac, Wis.
Frank Edwin Washburn, Leavenworth, Kans.
David Loyall Farragut Watson, Los Angeles, Cal.
Wade Clarence West, Manila, Philippine Islands
Herbert Angell Whitney, San Diego, Cal.
James Wilson, Montchanin, Del.
Stanley Hubert Wright, Philadelphia, Pa.
Charles Wuest, Jr., Cincinnati, Ohio

As Juniors

Fred Drexel Bowlus, Pasadena, Cal.
Graham Bernard Bright, Blacksburg, Va.
John James Clark, St. Louis, Mo.
Alfred Henry Clarke, Portland, Ore.
Merton Clyde Collins, San Francisco, Cal.
Meyer Davis, Beaver Falls, Pa.
James Gordon Goodfellow, Lyttelton, New Zealand
Whitney Irwin Gregory, Louisville, Ky.
Alfred Sparks Hirzel, Wilmington, Del.
Henry Collins Hitt, Olympia, Wash.
Andrew Hall Holt, Burlington, Vt.
Frank Osborne Lee, Burlington, Vt.
Edwin Hall Marks, Washington, D. C.
William Floyd Way, Fresno, Cal.
Walter John Willis, New York City
Calvin Loughridge Wilson, Fort Worth, Tex.

The Secretary announced the transfer of the following candidates on September 3d, 1913:

From Associate Member to Member

Wallace Edward Belcher, New York City
Edward Fryling Black, New York City
Orrin Lawrence Brodie, New York City
John Augustus Bruce, Omaha, Nebr.
Walter Charnley, São Paulo, Brazil
Charles Edwin Collins, Philadelphia, Pa.
Clarence Goldsmith, Charlestown, Mass.
Verne LeRoy Havens, New York City

William Christian Hoad, Ann Arbor, Mich.
Adolph Judell, San Francisco, Cal.
Walter Burditt Leane, Santiago, Chili
Charles Tileston Leeds, Pasadena, Cal.
Frederick Ewbank Leefe, Florence, Ore.
Ira Welch McConnell, Boston, Mass.
Chester Leroy Post, Chicago, Ill.
John Charles Riedel, Brooklyn, N. Y.
Edward Farnum Rockwood, Boston, Mass.
Vernon Lyle Sullivan, Buenavista, Tex.
Leslie Abram Waterbury, Tucson, Ariz.
Gilbert Case White, Charlotte, N. C.
John Stephen Worley, Washington, D. C.

From Associate to Member

John Griffiths Brown, Philadelphia, Pa.
William Drumm Sell, Charleston, W. Va.

From Associate to Associate Member

John William Miller, Seattle, Wash.

From Junior to Associate Member

Nathan Benedict, Limon, Costa Rica
Claude Osgood Brown, Manila, Philippine Islands
Harold Hansen Fitting, San Francisco, Cal.
Frank Alvah Kittredge, Cloverdale, Cal.
George W Cass Lightner, Montreal, Que., Canada
Harry Clifford McClure, Toledo, Ohio
LeRoy McWethy, San Francisco, Cal.
Adelbert Philo Mills, Ithaca, N. Y.
John Robert Nichols, Cambridge, Mass.
Herbert Carleton Poore, East Braintree, Mass.
William Jenner Powell, Dallas, Tex.
Ralph Graham Shankland, Chicago, Ill.

The Secretary announced the following deaths:

James Richard Bell, of Ightham, Kent, England, elected Member, September 2d, 1896; died August 8th, 1913.

Frederic Danforth, of Gardiner, Me., elected Member, September 2d, 1891; died June 6th, 1913.

George Blinn Francis, of New York City, elected Junior, September 5th, 1883; Member, November 7th, 1888; died June 9th, 1913.

James Charles Haugh, of New Orleans, La., elected Member, February 2d, 1909; died July 6th, 1913.

Franklin Allen Hinds, of Watertown, N. Y., elected Member, May 3d, 1899; died August 23d, 1913.

NED HERBERT JANVRIN, of New York City, elected Junior, October 5th, 1897; Associate Member, June 5th, 1901; Member, April 4th, 1911; died July 17th, 1913.

ALONZO TYLER MOSMAN, of Washington, D. C., elected Member, July 1st, 1885; died June 9th, 1913.

HENRY ALEXANDER HARRIS, of Princeton, N. J., elected Junior, October 31st, 1899; Associate Member, June 7th, 1905; died January 9th, 1913.

ALBERTO DE LA TORRE, of Girardot, Colombia, elected Associate Member, October 3d, 1906; date of death unknown.

SAMUEL STOCKTON BOGART, of New York City, elected Associate, April 7th, 1886; died May 29th, 1913.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

September 3d, 1913.—President Swain in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bates, Bush, Clarke, Edwards, Endicott, Gerber, Metcalf, Ockerson, Ridgway, Smith, Snow, and Thomson.

The appointment of a Special Committee to Study the Question of Floods, Flood Prevention, and other allied subjects, was considered.

The appointment of a Special Committee to report on Water Legislation was considered.

A payment of $25 000 to reduce the mortgage debt of the Society was authorized.

The Report of the Nominating Committee was received.

The Secretary reported that President Swain, in accordance with the authority of the Board, has appointed Messrs. Charles M. Spofford, Walter L. Webb, and Daniel W. Mead a Committee to Recommend the Award of Prizes for the year ending with the *Transactions* of July, 1913.

The formation of the Seattle Association of Members of the American Society of Civil Engineers was reported, and the Constitution of that Association, as forwarded for the consideration of the Board, was approved.

The formation of the Portland Association of Members of the American Society of Civil Engineers was reported, and the Constitution of that Association, as forwarded for the consideration of the Board, was approved.

The method of selecting the Nominating Committee was considered, and a resolution passed unanimously, that it is the sense of the Board that there should be no change at this time in the method heretofore used, and the Secretary was instructed to proceed with the issue of circulars, etc., in the usual manner.

The resignations of 2 Members, 1 Associate Member, and 2 Juniors were accepted.

Ballots for membership were canvassed, resulting in the election of 13 Members, 40 Associate Members, 16 Juniors, and the transfer of 12 Juniors to the grade of Associate Member.

Twenty-one Associate Members and 2 Associates were transferred to the grade of Member, and 1 Associate was transferred to the grade of Associate Member.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

October 1st, 1913.—8.30 P. M.—A regular business meeting will be held, and a paper by William J. Wilgus, M. Am. Soc. C. E., entitled "Physical Valuation of Railroads," will be presented for discussion. This paper was printed in *Proceedings* for May, 1913.

October 15th, 1913.—New Orleans Meeting.—The meeting of the Society scheduled for October 15th, 1913, will be held in New Orleans, La., and a paper by W. E. Fuller, M. Am. Soc. C. E., entitled "Flood Flows," will be presented for discussion. Mr. Fuller's paper was printed in *Proceedings* for May, 1913.

In connection with this Meeting the Louisiana Members have arranged a programme covering Wednesday, Thursday, Friday, and Saturday, October 15th to 18th, inclusive, and it is hoped that there will be a large attendance of the members and the ladies of their families.

Arrangements for this—the first Society Meeting, other than the Annual Convention, held away from headquarters—are in the hands of the following:

Local Committee.—Frank M. Kerr, J. F. Coleman, E. L. Jahncke, Sidney F. Lewis, Arsene Perrilliat, A. M. Shaw, W. H. Williams, A. M. N. Blamphin.

The address of the Committee is Room 920, Hibernia Bldg., New Orleans, La.

Headquarters.—The Headquarters of the Society will be the Grunewald Hotel.

Hotel Reservations.—It is very desirable, in view of the fact that another Convention is to be held in New Orleans overlapping the dates for this Meeting, that hotel reservations be made as soon as possible, addressing the Local Committee. Prompt attention in this matter is urged, not only that the best accommodations available may be secured, but also to enable the Committee to know the number who will take part in the various excursions and entertainments.

Programme.—The following programme has been arranged. It is subject to minor changes, and it is here printed for the information of the Membership.

It is hoped that Members may arrange to arrive in New Orleans on Tuesday, October 14th.

New Orleans Meeting (Continued)

Wednesday, October 15th.—10 A. M.—Meeting of Society.

(1) Brief Welcoming Addresses by the Governor of Louisiana, the Mayor of New Orleans, and the President of the Louisiana Engineering Society.

(2) Brief talk by a local Member descriptive of topographical peculiarities of New Orleans and vicinity, and calling attention to technical practice in this territory which, by reason of local conditions, is different from the usual standard practice elsewhere.

(3) Address on the Problem of Mississippi River Control.

Afternoon: Automobile trip through the City.

8 P. M. Meeting of Society.

(1) Paper entitled "Flood Flows," by Weston E. Fuller, M. Am. Soc. C. E.

(2) Illustrated address on the Sewerage, Drainage, and Water Works of New Orleans.

Thursday, October 16th.—10 A. M. River trip in New Orleans Harbor; Lunch on steamer. Automobile trip from steamer to Water Filtration Plant, then to a typical Drainage Pumping Station and to other points of Engineering interest, returning to hotels about 5:30 P. M.

8 P. M. Smoker and Entertainment, which it is hoped the ladies of the party will attend.

Friday, October 17th.—In the morning, under special guides, parties will be taken through the old French Quarter.

In the afternoon a Garden Party will be given at the Country Club. Golf on Links of Country Club for those who play that game.

8:30 P. M. Dinner Dance.

Saturday, October 18th.—The day will be devoted to a visit to Avery's Island Salt Mines near New Iberia, La., by special train, with probable stop-over to inspect a large sugar estate. Returning to New Orleans about 6 P. M.

Excursion to Panama.—It has been suggested that some of the Members may desire to visit the Panama Canal in connection with this meeting.

The United Fruit Company's steamers sail from New Orleans to Panama on Saturday morning, and reservations will be made by the Local Committee for those who will inform them of their intention to make the trip.

November 5th, 1913.—8.30 P. M.—This will be a regular business meeting. Two papers will be presented for discussion, as follows: "Concrete Bridges: Some Important Features in Their Design," by Walter M. Smith, Sr., M. Am. Soc. C. E., and Walter M. Smith, Jr.,

Jun. Am. Soc. C. E.; and "The Effect of Saturation on the Strength of Concrete," by J. L. Van Ornum, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for August, 1913.

November 19th, 1913.—8.30 P. M.—At this meeting a paper by Richard R. Lyman, Assoc. M. Am. Soc. C. E., entitled "Measurement of the Flow of Streams by Approved Forms of Weirs, with New Formulas and Diagrams," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

Proceedings, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, R. W. Toll, Jun. Am. Soc. C. E., 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Cub.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following

officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and Alexander Bonnyman, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

Seattle Association

On June 30th, 1913, the Seattle Association of Members of the American Society of Civil Engineers was organized with the following officers: Samuel H. Hedges, President; Ernest B. Hussey, Vice-President; and Joseph Jacobs, Secretary-Treasurer.

Philadelphia Association

At its meeting of June 4th, 1913, the Board of Direction of the Society considered and approved the proposed Constitution of the Philadelphia Association of Members of the American Society of Civil Engineers.

Portland Association

(Abstract of Minutes of Meeting)

June 18th, 1913.—At a meeting held at the Commercial Club, Portland, Ore., F. I. Fuller, M. Am. Soc. C. E., in the chair; Charles J. McGonigle, M. Am. Soc. C. E., Secretary; and present, also, 22 members of the Society, the following business was transacted:

E. G. Hopson, M. Am. Soc. C. E., Chairman of the Committee on Organization, read a letter from Charles Warren Hunt, Secretary of the American Society of Civil Engineers, and recommended that the constitution and by-laws of the San Francisco Association be adopted with amendments to suit the local conditions.

A resolution was adopted to organize formally a Portland Association of Members of the American Society of Civil Engineers, to be effective if 40 members become enrolled.

The constitution and by-laws of the San Francisco Association were read by the Secretary, voted on article by article, and, with necessary amendments, adopted by unanimous vote.

A Committee on Nomination, Mr. Mason, Chairman, recommended the election of the following officers, and they were elected by unanimous vote:

President, E. G. Hopson,
First Vice-President, W. S. Turner,
Second Vice-President, D. D. Clarke,
Treasurer, G. B. Hegardt,
Secretary, Charles J. McGonigle.

Mr. Hopson took the chair.

A motion was adopted that the Board of Directors of the Association offer to act in an advisory capacity to the Mayor and Commissioners of Portland in the selection of a City Engineer.

(In accordance with this motion, the Board of Directors met on June 19th, 1913, and instructed the President, Mr. Hopson, to consult with the Mayor and Commissioners in relation to the appointment of a City Engineer.)

A motion was adopted that it is the sense of this Association that the City Engineer of Portland should receive a salary commensurate with the position and favorably comparable with the salaries paid to City Engineers in other cities.

Adjourned.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From August 1st to September 2d, 1913)

DONATIONS*

PRINCIPLES AND METHODS OF MUNICIPAL TRADING.

By Douglas Knoop. Cloth, 9 x 5¾ in., 17 + 409 pp. London, Macmillan and Co., Limited, 1912. $3.25.

Municipal trading, as discussed by the author, relates to economic undertakings which are self-supporting, and the book embodies, it is stated, the results of his work and investigations on the subject as Langton Fellow at the University of Manchester. His aim, the preface states, has been to show what has happened in the past and what is being done at the present in municipal trading, and to make a survey of the most important problems relating to the subject, his inquiries being practically limited to Great Britain and Germany. To this end he has described the policies and methods commonly adopted by local authorities in their trading undertakings, the various reasons which have led to the development of such trading, and the financial aspects of the problem, as well as the results achieved by such enterprises. The Chapter headings are: The Scope of Municipal Trading; The Development of Municipal Trading; The Extent of Municipal Trading; The Management of Municipal Trades; The Financial Aspects of Municipal Trading; The Selling Policies of Municipal Trades; The Labour Policy of Municipal Trades; The Results of Municipal Trading; Summary and Conclusion; Appendix A, Bibliographical Note; Appendix B, List of Municipal Tramway Undertakings in the United Kingdom; Appendix C, Hourly Traffic on Typical Manchester and Glasgow Train Routes; Appendix D, Supplementary Statistics Concerning Municipal Trading during 1910-11; Index.

PLANS OF GRAIN ELEVATORS.

Third Edition. Cloth, 12¼ x 9¼ in., illus., 378 pp. Chicago, Grain Dealers' Journal, 1913. $5.00.

In a sub-title this volume is described as "a book in the interests of the construction of better grain elevators", and the preface states that it is designed to assist grain dealers in providing and maintaining first-class facilities for storing, handling, and cleaning grain. Plans and views of grain elevators and grain storehouses at various places and for various uses are given, together with detailed descriptions of the foundations, mechanical equipment, power plant and transmission systems, scales, arrangement of office and working floors, etc., of such buildings. The Contents are: Terminal Elevators; Transfer and Cleaning Elevators; Country Elevators.

CONCRETE ROADS AND PAVEMENTS.

By E. S. Hanson. Cloth, 8 x 5 in., illus., 227 pp. Chicago, The Cement Era Publishing Company, 1913. $1.00.

A complete revision of the science of roadmaking has been made necessary within the last few years, it is stated, on account of the high-speed vehicles now in use, the wide tires of which develop great suction. Concrete has come to be recognized, it is further stated, as the best material to meet these new conditions, and this volume, which is said to be a compilation of facts, has been issued as a convenient handbook containing everything of value that is known to date on the subject. It is hoped that this book will serve not only to stimulate the construction of concrete roadways, but that it will furnish roadmakers with specific data as to the best class of concrete roads and pavements. The Contents are: Concrete as a Road Material; The Construction of Concrete Roadways; The Roads of Wayne County, Michigan; Cost of Concrete Roads in Illinois; Other Examples of Concrete Roads; Some Data on City Pavements; Reinforced Concrete Pavements; Concrete in Combination with Other Materials; Patented Concrete Pavements; The Theory and Practice of Joints; Some Tests on Concrete as a Roadway Material; Bridges and Culverts; Sidewalks, Curbs, and Gutters; Appendix A, Specifications of National Association of Cement Users—Roads and Pavements; Appendix B, Wayne County Specifications; Appendix C, Mason City Specifications; Appendix D, Specifications of Illinois Highway Commission; Appendix E, Specifications for Blome Granitoid Pavement; Appendix F, Specifications for Blome Granocrete Pavement; Appendix G, Specifications for Bitustone Pavement; Appendix H, Specifications of Dolarway Pavement; Appendix I, Specifications for Hassamite; Appendix J, Specifications for Bridges and Culverts; Appendix K, Specifications for Sidewalks; Appendix L, Specifications for Curbs and Gutters.

*Unless otherwise specified, books in this list have been donated by the publishers.

FABRICATION DE L'ACIER.

Par H. Noble. Deuxième Edition, Revue et Augmentée. Paper, 10 x 6½ in., illus., 7 + 632 pp. Paris, H. Dunod et E. Pinat, 1913. 25 francs.

The author states that this volume is devoted to a general study of the metallurgy of steel, particularly of the machinery and apparatus, including the latest improvements, used in steelworks. In discussing this machinery he states that he has confined his study to the general principles of the subject, offering no criticism of the various types described and avoiding the details of their mechanical construction. The Chapter headings are: Propriétés Générales des Aciers; Etude Théorique de la Conversion; Fontes de Conversion, Cubilots, Mélangeurs; Chaux d'Aciérie; Etude Pratique de la Conversion; Recarburation, Coulée en Poche; Etablissement des Convertisseurs; Garnissages Basiques; Garnissages Acide; Machines Soufflantes; Etude Théorique de l'Affinage sur Sole; Matières Premières Employées dans l'Affinage sur Sole; Etude Pratique de l'Affinage sur Sole; Chauffage des Fours Martin; Construction des Fours Martin; Entretien des Fours Martin; Procédés Mixtes; Lingots d'Acier; Coulée en Lingotières; Poches et Appareils de Coulée; Personnel, Compatibilité.

ECONOMIES IN BRICKYARD CONSTRUCTION AND OPERATION.

By Ellis Lovejoy. Cloth, 7¾ x 5½ in., 72 pp. Indianapolis, T. A. Randall & Co., 1913. $1.00.

The subject-matter contained in this volume first appeared serially in *The Clay-Worker*, and is now issued in book form for handy use in the brickyard. The author states that as the great waste in the average brickyard is the result of lack of experience, extravagance in construction, and operation, insufficient capital, quality and quantity of clay used, need of cost systems and records, etc., he has written this book as a sort of review of many investigations of such details in plants of various types and at various places. The Contents are: Brick Business Not so Simple as It Seems; Economies in Clay Gathering; Economies in the Preparation of the Clay; Economies in the Feeding, Pugging and Manufacture; Economies in Conveying and Drying; Economies in Setting; Economies in the Burning; Drawing Bricks from Kilns and Sorting; Use of Producer Gas in Burning.

THE PRACTICAL METALLOGRAPHY OF IRON AND STEEL.

By John S. G. Primrose. Boards, 8½ x 5½ in., illus., 129 pp. Manchester, England, The Scientific Publishing Company. 3 shillings.

This book, it is stated, comprises those chapters contained in the second edition of Sexton's "The Metallurgy of Iron and Steel", which relate to metallography. The subject-matter has been revised and rewritten by the author, and is published as a separate volume for use as reference by the student in metallurgical engineering and as an aid to those who are commencing a study of metallography by means of the microscope, being stated to be an accurate résumé of present knowledge of the subject. The chapter on metallographic apparatus, it is stated, is intended as a guide for those who contemplate the purchase of an outfit for use in a works laboratory, and includes a detailed description of the use of the various machines. The Contents are: Microstructure of Iron and Steel; Constitution of Iron and Steel; Heat Treatment of Iron and Steel; Micrographic Examination of Failures; Appendix I, Metallographic Apparatus and Its Manipulation; Appendix II, Bibliography; Index.

AN INTRODUCTION TO THE MATHEMATICAL THEORY OF HEAT CONDUCTION:

With Engineering and Geological Applications. By L. R. Ingersoll and O. J. Zobel. Cloth, 8½ x 5¾ in., illus., 6 + 171 pp. Boston, New York, Chicago, London, Ginn and Company, 1913. $1.60.

Although written primarily to meet the need of a suitable textbook on the subject, the preface states that the aim of the authors in presenting this book has been two-fold: First, a development of the subject with special reference to the needs of the student who has neither the time nor mathematical preparation to pursue the study at great length, to which end, it is said, fewer types of problems have been used and less stress has been placed on the purely mathematical derivations such as uniqueness, existence and convergence theorems; and second, the presentation of clear and specific applications of the many theoretical and practical applications of which the results are susceptible. It is hoped, that the subject-matter may prove of interest to engineers as well as to students, as many applications have been chosen with special reference to their technical importance, for example, the "theory of the fire-proof wall". The Contents are: Introduction; The Fourier Con-

duction Equation; The Steady State: One Dimension; The Steady State: More Than One Dimension; Periodic Flow of Heat in One Dimension; Fourier's Series; The Linear Flow of Heat; The Flow of Heat in More Than One Dimension; The Formation of Ice; Appendices A to F; Index.

GAS ANALYSIS.

By L. M. Dennis. Cloth, 7¼ x 5 in., illus., 16 + 434 pp. New York, The Macmillan Company, 1913. $2.10.

The preface states that, in its general plan, this book follows the last edition of the English translation of Hempel's "Methods of Gas Analysis", full descriptions of his methods of both technical and exact gas analysis having been incorporated in the text with his permission, with modifications, in some cases, of the apparatus and manner of its manipulation. Procedures for determining most of the gases to be met with in analytical work are described, including certain methods of exact analysis adapted to specific determinations, and as no attempt has been made to include descriptions of all the new methods, numerous references are made in the text to original articles. The author has not included, it is stated, the separation of the gases in the argon group for the reason that rapid and simple methods for such determination have not as yet been perfected. As much is said to depend on the skill with which the analytical work is performed, the manipulation of each of the generally used type of apparatus is discussed in detail. The Contents are: The Collection and Storage of Gases; The Measurement of Large Samples of Gas; The Measurement of Gases; The Determination of a Specific Gravity of a Gas; Arrangements and Fittings of the Laboratory; The Hempel Apparatus for Exact Gas Analysis with Mercury as the Confining Liquid; the Construction and Connection of Apparatus; Purification of Mercury; Absorption Apparatus for Use with Large Volumes of Gas; The Combustion of Gases; The Determination of Gases by Combustion; Properties of the Various Gases and Methods for Their Determination; Flue Gas Analysis; Illuminating Gas, Fuel Gas; The Determination of the Heating Value of Fuel; Acetylene Gas; Examination of Atmospheric Air; The Analysis of Saltpeter and Nitric Acid Esters (Nitroglycerine, Gun-Cotton) with the Nitrometer; The Lunge Nitrometer; Tables; Indexes.

ANNUAL INTERNATIONAL NUMBER OF "THE SHIPBUILDER," 1913:

A Survey of the Scientific and Technical Progress in Naval Architecture and Marine Engineering. Cloth, 10 x 7½ in., illus., 320 pp. Newcastle-on-Tyne, "The Shipbuilder" Press; London, Gilbert-Wood Press, 1913. $1.45.

This volume, the first number of which was published in June, 1912, is stated to be a concise and comprehensive survey of the world's work in shipbuilding and allied industries for 1913. It is intended as a reference book on the more technical phases of the industry, and contains many papers on the subject read before British and foreign scientific and technical societies. It is also intended as a résumé of the latest developments in naval architecture and marine engineering in Great Britain.

SIMPLIFIED FORMULAS AND TABLES

For Floors, Joists and Beams; Roofs, Rafters and Purlins. By N. Clifford Ricker. Cloth, 9¼ x 6 in., illus., 6 + 77 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1913. $1.50.

The author states that the formulas generally contained in textbooks on the mechanics of engineering materials, for rupture and deflection in structural problems, are inconvenient, because of the large numbers which have to be used in their computation. By transforming these formulas and changing lengths from inches to feet, loads from pounds to tons, constants for material from pounds to tons, and bending moments from inch-pounds to foot-tons, thus simplifying the results, he gives in this volume, it is stated, a simple system of formulas and tables which can be applied by using a slide rule or a four-place table of logarithms, and which he hopes will be of use to architects and engineers. Tables are included for rectangular cross-sections of timbers and standard cross-sections of cast-iron lintels, as well as of four-place logarithms, together with a series of numerical examples which have been carefully worked out for the application of these formulas. A partial list of Contents is as follows: Ordinary Formulas for Beams; Notation in Ordinary Formulas; Table A of Ordinary Formulas; Inconveniences in Use; Method of Simplifying Formulas; Notation in Simplified Formulas; Method of Simplification; etc., etc.

GRAPHICS AND STRUCTURAL DESIGN.

By H. D. Hess. Cloth, 9¼ x 6 in., illus., 8 + 426 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1913. $3.00.

A knowledge of this subject is necessary to the designer, the preface states, while acquaintance with the methods used to determine the stresses in, and the design of, structures is desirable for others in designing for strength, whether for structures or machines. The author states that the volume is intended for his classes in General Engineering Design in Sibley College, Cornell University, and while the treatment of the subject has been kept as general as possible, it is hoped it may prove useful as a reference book for designers whose work is not too highly specialized. The determination of stresses has not been confined to graphical means, it is stated, the usual methods having been included, and the problems discussed are those on the border line of Civil and Mechanical Engineering. The Chapter Headings are: Materials; Graphics; Stresses in Structures; Algebraic Determination of Stresses; Influence Diagrams; Tension Pieces, Compression Pieces and Beams; Columns; Girders for Conveyors; Trusses, Bents and Towers; Design of Steel Mill Buildings; Design of a Plate-Girder Railway Bridge; Crane Frames; Girders for Overhead Electric Traveling Cranes; Reinforced Concrete; Foundations; Chimneys; Retaining Walls; Bins; Shop Floors; Walls and Roofs; Specifications; Problems; Index.

THE THEORY AND DESIGN OF STRUCTURES:

A Text-Book for the Use of Students, Draughtsmen, and Engineers Engaged in Constructional Work. By Ewart S. Andrews. Third Edition. Cloth, 8¾ x 5¾ in., illus., 12 + 618 pp. London, Chapman & Hall, Ltd., 1913. 9 shillings.

This textbook, it is stated, is based on lecture notes used by the author in his classes and from examples in actual practice. The book is said to be written largely from a graphical standpoint, but many of the problems are treated mathematically. It contains, the author states, some matter which is not found in English textbooks in common use, such as, the French or St. Venant method of dealing with combined bending and shear stresses, the general theory of curved beams and non-symmetrical beams, and the strength of heterogeneous structures as reinforced concrete, a special effort having been made to make the chapter on struts and columns clear. Attention is particularly called to the worked problems which are said to be a feature of the book. In this, the third edition, all the new matter, the most important of which is stated to be the note on Stanton's experiments on wind pressure and the new exercises, is contained in an Appendix. The notation in the chapter on Reinforced Concrete has been made to agree, it is said, with that proposed by the Concrete Institute. The Chapter headings are: Stress, Strain, and Elasticity; Principles of Design, Working Stresses, etc., Wind Pressure; Forces, Areas, and Moments; Riveted Joints and Connections; Bending Moments and Shearing Forces in Beams; Stresses in Beams; Bending Moments and Shearing Forces for Rolling Loads; Deflection of Beams; Fixed and Continuous Beams; Distribution of Shearing Stresses in Beams; Framed Structures; Columns, Stanchions, and Struts; Suspension Bridges and Arches, Masonry Structures; Reinforced Concrete and Similar Structures; Design of Steelwork for Buildings, etc.; Design of Roofs; Design of Bridges and Girders; Appendix I; Appendix II, Tables of Properties of British Standards; Exercises; Index.

FURTHER PROBLEMS IN THE THEORY AND DESIGN OF STRUCTURES:

An Advanced Text-Book for the Use of Students, Draughtsmen, and Engineers Engaged in Constructional Work. By Ewart S. Andrews. Cloth, 8¾ x 5¾ in., illus., 8 + 236 pp. London, Chapman & Hall, Ltd., 1913. 7 shillings, 6 pence.

As several recent problems in construction which are of interest and importance to engineers were omitted in the author's "Theory and Design of Structures", this book has been written, it is stated, as a supplement to that volume, the general treatment of the subject-matter being the same in both. All the steps in the mathematical deductions have been given, it is said, even at the risk of criticism, as an aid to the student. The first portion of the book deals, it is stated, with the development of the method of Influence Lines. This is followed by the Principle of Work and its application to deflections of framed structures, redundant frames, and rigid arches; and the last part is devoted to a discussion of Portals and Wind Bracings, and Secondary Stresses. The Contents are: Influence Lines; Influence Lines for Simply Supported Frames; Influence Lines for Fixed and Con-

tinuous Beams; Influence Lines for Arches and Suspension Bridges; Internal Work; Deflections of Framed Structures; Stresses in Redundant Frames; Stresses in Rigid or Elastic Arches; Stresses in Portals and Wind Bracings; Secondary Stresses in Structures; Index.

THE ELEMENTS OF SPECIFICATION WRITING:

A Text-Book for Students in Civil Engineering. By Richard Shelton Kirby. Cloth, 9¼ x 6 in., 7 + 125 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1913. $1.25.

This book, it is stated, is the outgrowth of a series of lectures delivered by the author before the Senior Class in Civil and Sanitary Engineering in Sheffield Scientific School, and is a textbook on specification writing (not a collection of specifications) which it is hoped will prove of value to the young engineer as well as the student. The important features of the text are said to be the concise description of the fundamentals of a contract with its plans and specifications; the chapters devoted to Advertisement and Proposals; the thorough exposition, from an engineering viewpoint, of the General Clauses of a specification, including the citation and discussion of cases illustrating their application, as well as a number of model clauses; the practical suggestions concerning Specific Clauses, of which outlines for nine construction projects are given; and the classified list of references to recent articles on the subject in technical journals and in publications of technical societies, contained in the Appendix. The Contents are: Introduction; Contract and Bond; Advertisement (or Notice to Contractors) and Information for Bidders; Proposal; The Composition of Specifications; General Clauses—Specifications and Plans; The Engineer During Construction; The Contractor and His Workmen; The Contractor's Miscellaneous Responsibilities; Progress of Work; Terms of Payment; Specific Clauses; Outlines of Specific Clauses; Appendix: References; Index.

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Untersuchungen über den Zusammenhang der Erscheinungen in Wasserläufen auf Grund hydrometrischer Erhebungen, zur Förderung des Flussbaues und seines Unterrichtes für Studierende und Ingenieure. Von C. Krischan. 2 Vol. Leykam, Graz, 1912.

Mitteilungen über Forschungsarbeiten auf dem Gebiete des Ingenieurwesens insbesondere aus den Laboratorien der technischen Hochschulen. Herausgegeben vom Verein deutscher Ingenieure. Hefte 135–137. Julius Springer, Berlin, 1913.

Chloride of Lime in Sanitation. By Albert H. Hooker. John Wiley & Sons, Inc., New York; Chapman & Hall, Limited, London, 1913.

Steam Power Plant Engineering. By G. F. Gebhardt. Fourth Edition. John Wiley & Sons, Inc., New York; Chapman & Hall, Limited, London, 1913.

Mathematical Monographs; Nos. 1–12. Edited by Mansfield Merriman and Robert S. Woodward. John Wiley & Sons, New York; Chapman & Hall, London, 1906-13.

The Basic Open-Hearth Steel Process. By Carl Dichmann. Translated and Edited by Alleyne Reynolds. D. Van Nostrand Co., New York, 1913.

Universal Directory of Railway Officials, 1913. Compiled from Official Sources under the Direction of S. Richardson Blundstone. The Directory Publishing Company, Limited, London.

Das Maschinen-Zeichnen. Von A. Riedler. Zweite, neubearbeitete Auflage. Julius Springer, Berlin, 1913.

Lehrbuch des Hochbaues. Herausgegeben von Esselborn. Erster Band. Zweite, stark vermehrte Auflage. Wilhelm Engelmann, Leipzig, 1913.

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GALLAGHER, JOSEPH. 1216 First National Bank Bldg., Denver, Colo.

GASTON Y ROSELL, FRANCISCO JOSÉ. Engr., River and Harbor Impvts., Dept. of Public Works; Res., 50 Ninth St., Vedado, Havana, Cuba.

GELLATLY, JOHN THOMPSON BISSET. Cons. Engr., P. O. Box 37, Bethulie, Orange Free State, South Africa.

GILDERSLEEVE, GEORGE SNYDER. Branch Mgr., Trussed Concrete Steel Co., 444 Gurney Bldg. (Res., The Wolcott, 409 East Fayette St.), Syracuse, N. Y.

GILKEY, THOMAS ALVIN. Cons. Engr., 318 Mercantile Bldg., New Castle, Pa.

GORHAM, FRED ALLEN. Asst. Engr., U. S. Reclamation Service, Great Falls, Mont.

HAMMOND, LESTER CLARK. Supt., Stillwater Contracts, Barclay Parsons & Klapp, Altmar, N. Y.

HOSMER, RALPH HERBERT. Box 648, Harrisburg, Pa.

HUBBELL, GEORGE SCOTT. Care, J. G. White & Co., Atlantic Coast Line Bldg., Wilmington, N. C.

HULL, GORDON BURNETT GIFFORD. Highfield, Blackwell, Bromsgrove, England.

JAHNCKE, ERNEST LEE. Pres., The Jahncke Nav. Co., 814 Howard Ave. (Res., 1823 Palmer Ave.), New Orleans, La.

KASSEBAUM, FREDERICK WILLIAM, JR. Works Mgr., Houston Structural Steel Co., Houston, Tex.

KELTON, FRANK CALEB. Asst. Prof. of Civ. Eng., Univ. of Arizona, 412 East 4th St., Tucson, Ariz.

LEETE, PERCY REMINGTON. Box 71, Shortbeach, Conn.

LEMEN, WILLIAM CASWELL SMITH. U. S. Asst. Engr., U. S. Engr. Office, Savannah, Ga.

MARSHALL, THOMAS CLAWSON. Res. Engr., B. & O. R. R., Martinsburg, W. Va.

ASSOCIATE MEMBERS (*Continued*)

MARTIN, WILLIAM FRANKLIN. Asst. Prof., Eng. Mechanics, Univ. of California; Cons. Engr. (Ellery & Martin), Merchants Exchange Bldg., San Francisco, Cal.

MATLAW, ISAAC SOLON. 17 Battery Pl., Room 1219, New York City.

MATSON, JESSE SIDWELL. County Surv., 74 Fisk St., Ashtabula, Ohio.

MILLER, HENRY LANARK. Engr., Section of Rds. and Bridges, Dept. of Public Works, Casilla 21, Mendoza, Argentine Republic.

MINOR, CYRUS EDWARD. Asst. Engr., C. & W. I. R. R., 6937 Parnell Ave., Chicago, Ill.

MOFFAT, JAMES ALEXANDER. Bridge Engr., C. N. P. Ry., Care, Twohy Bros., Camp 83, Kamloops, B. C., Canada.

NIKOLITCH, MILAN. Asst. Chf. Engr., Chou River Irrig. Project, Pessotchnaya Ul 26, K. O., Petersburg, Russia.

OLSON, NORMAN T. Asst. Engr., U. S. Reclamation Service, Babb, Mont.

PAGE, ARTHUR SOUTHWICK. Dist. Engr., J. G. White Eng. Corporation, Box 183, Wilmington, N. C.

PATTERSON, CLAIR BRANDON. Eng. Dept., L. S. & M. S. Ry., 314 Hillwood Drive, Toledo, Ohio.

PIERCE, PAUL LEON. Constr. Supt., Phœnix Constr. Co., Brigham City, Utah.

POTTER, JAMES ROWLAND. Vice-Pres., Brocklehurst & Potter Co., Marbridge Bldg., New York City.

ROSENTHAL, JOSEPH JACOB. 322 Parnassus Ave., San Francisco, Cal.

RUGGLES, ARTHUR VALENTINE. Care, Public Service Comm., 103 East 125th St. (Res., 3068 Perry Ave.), New York City.

SAVAGE, SEWARD MERRILL. Treas., Alto Constr. Co., 18 Kemble St., Utica, N. Y.

SAYFORD, NED HENSEL. With George W. Fuller, 170 Broadway, New York City (Res., 131 Glenwood Boulevard, Schenectady, N. Y.).

SCHUBERT, CHARLES WESLEY. Engr. of Constr., Bldg. Dept. (Res., 1357 East 110th St.), Cleveland, Ohio.

SHEFFIELD, EDWARD NEWTON. Care, C. R. R. of N. J., Room 226, Central Bldg., New York City.

SMITH, CLARENCE URLING. Asst. Engr. in Chg. of Lewistown Terminals, C., M. & St. P. Ry., P. O. Box 25, Lewistown, Mont.

STONE, WILLARD WILBERFORCE. Office of Public Rds., U. S. Dept. of Agri., Washington, D. C.

STRAWN, THOMAS CORWIN. 355 West 55th St., New York City.

TAFT, JESSE RUSSELL. Care, Emory & Eisenbrey, 50 Church St., New York City.

TRAVERS-EWELL, ANDREW. Care, Westinghouse, Church, Kerr & Co., New York Life Bldg., Chicago, Ill.

TRUE, ALBERT OTIS. 107 Third Ave., Rensselaer, N. Y.

VOORHES, KIMBROUGH ENOCH. 5009 Gramercy Pl., Los Angeles, Cal.

ASSOCIATE MEMBERS (*Continued*)

WILLARD, WILLIAM CLYDE. Asst. Prof. of Ry. Eng., Dept. of Rys., McGill Univ., Montreal, Que., Canada.

ASSOCIATES

BELZNER, THEODORE. Insp.-in-Chg., Reinforcing of End Spans, Williamsburgh Bridge, Dept. of Bridges, City of New York, 400 Kent Ave., Brooklyn, N. Y. (Res., 606 West 135th St., New York City.).

BROWN, WILLIAM ALDEN. Gen. Mgr., Aberthaw & Bristol Channel Portland Cement Works, Aberthaw, Glamorgan, Wales.

JUNIORS

BAILEY, PAUL. Res. Engr., Haviland & Tibbetts, 1505 Josephine St., Berkeley, Cal.

BEAN, PAUL JONES. Civ. Engr., U. S. N., U. S. Naval Station, Pearl Harbor, Hawaii.

BESWICK, JAMES EVERETT. With State Highway Comm., 36 Lancaster St., Albany, N. Y.

BILYEU, CHARLES SMITH. New York Representative, Colby & Christie of Philadelphia, 1 Madison Ave., New York City.

BOWMAN, RALPH MCLANE. Bridge Designer, L. E. & West. R. R., Care, Chf. Engr., Indianapolis, Ind.

COLMAN, JAMES BLAINE THOMAS. 711 South Ingalls St., Ann Arbor, Mich.

HAMMILL, HAROLD BERNARD. Roseville, Cal.

HARRIS, FRANK SAMPSON MASON. 454 Sixty-First St., Oakland, Cal.

HUTCHINS, ROLAND ELLIS. Coll. of Applied Science, Iowa City, Iowa.

KELLERSBERGER, ARNOLD CHARLES. Care, Bowers Southern Dredging Co., Galveston, Tex.

KITTREDGE, FRANK ALVAH. Medford, Ore.

LETTON, HARRY PIKE. San. Engr., U. S. Public Health Service, 1437 Clifton St., N. W., Washington, D. C.

MARSH, EMMETT LINCOLN. Contr. Engr. (Marsh & Gardenier, Inc.), Gold Run, Cal.

MILLER, HAROLD EDMUND. 88 Congress St., St. Albans, Vt.

PAYROW, HARRY GORDON. Res. Engr., Lynn Additional Water Supply, 150 Bellevue Rd., Lynn, Mass.

PETERSON, GARFIELD CHRISTIAN. Glenbeulah, Wis.

PORTER, HARRY FRANKLIN. 5401 Rosalie Ave., Chicago, Ill.

RENNELL, HENRY HURD. Secy. and Treas., Rennell Constr. Co., Inc., 26 Cortlandt St., New York City.

ROBERTS, RICHARD FRANCIS. 138 Centre St., Nutley, N. J.

SLEPPY, KIRBY BALDWIN. With Pacific Elec. Ry., Care, Y. M. C. A., San Bernardino, Cal.

SMITH, HENRY BOUTWELL. 910 Alaska Commercial Bldg., San Francisco, Cal.

STIEVE, WILLIAM MATTHEW. Asst. Engr., Barge Canal, 41 Phelps St., Lyons, N. Y.

JUNIORS (*Continued*)

TURNER, ARTHUR HUBESTY. Second Lieut., U. S. M. C., 188 West River St., Wilkes-Barre, Pa.

WHITMAN, WILLIAM SATTERWHITE. 713½ Woodland St., Nashville, Tenn.

WHITMORE, HAROLD CUSHING. Asst. Engr., Somerset Dam Power Constr. Co., Wilmington, Vt. (Res., 91 Baker St., Lynn, Mass.).

WILEY, RALPH BENJAMIN. Asst. Prof. of San. and Hydr. Eng., Purdue Univ., 1012 Seventh St., West Lafayette, Ind.

WINTON, WALTER FERRELL. Lieut., First U. S. Field Artillery, Honolulu, Hawaii.

DEATHS

BELL, JAMES RICHARD. Elected a Member, September 2d, 1896; died August 8th, 1913.

HINDS, FRANKLIN ALLEN. Elected a Member, May 3d, 1899; died August 23d, 1913.

TORRE, ALBERTO DE LA. Elected an Associate Member, October 3d, 1906; date of death unknown.

Total Membership of the Society, September 4th, 1913, 7 087.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(July 31st to September 1st, 1913)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal*, Assoc. Eng. Soc., Boston, Mass., 30c.
(2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur*, München, Germany.
(8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
(9) *Engineering Magazine*, New York City, 25c.
(10) *Cassier's Magazine*, New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News*, New York City, 15c.
(14) *Engineering Record*, New York City, 10c.
(15) *Railway Age Gazette*, New York City, 15c.
(16) *Engineering and Mining Journal*, New York City, 15c.
(17) *Electric Railway Journal*, New York City, 10c.
(18) *Railway and Engineering Review*, Chicago, Ill., 15c.
(19) *Scientific American Supplement*, New York City, 10c.
(20) *Iron Age*, New York City, 20c.
(21) *Railway Engineer*, London, England, 1s. 2d.
(22) *Iron and Coal Trades Review*, London, England, 6d.
(23) *Railway Gazette*, London, England, 6d.
(24) *American Gas Light Journal*, New York City, 10c.
(25) *Railway Age Gazette*, Mechanical Edition, New York City, 20c.
(26) *Electrical Review*, London, England, 4d.
(27) *Electrical World*, New York City, 10c.
(28) *Journal*, New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal*, Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil*, Paris, France, 1 fr.
(34) *Portefeuille Economiques des Machines*, Paris, France.
(35) *Nouvelles Annales de la Construction*, Paris, France.
(36) *Cornell Civil Engineer*, Ithaca, N. Y.
(37) *Revue de Mécanique*, Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
(39) *Technisches Gemeindeblatt*, Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
(41) *Elektrotechnische Zeitschrift*, Berlin, Germany.
(42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées*, Paris, France.
(44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Colliery Engineer*, Scranton, Pa., 25c.
(46) *Scientific American*, New York City, 15c.
(47) *Mechanical Engineer*, Manchester, England, 3d.
(48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m.
(49) *Zeitschrift für Bauwesen*, Berlin, Germany.
(50) *Stahl und Eisen*, Düsseldorf, Germany.
(51) *Deutsche Bauzeitung*, Berlin, Germany.
(52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
(53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria, 70h.
(54) *Transactions*, Am. Soc. C. E., New York City, $12.

(55) *Transactions*, Am. Soc. M. E., New York City, $10.
(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.
(57) *Colliery Guardian*, London, England, 5d.
(58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
(60) *Municipal Engineering*, Indianapolis, Ind., 25c.
(61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings*, Inst. C. E., London, England.
(64) *Power*, New York City, 5c.
(65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
(66) *Journal of Gas Lighting*, London, England, 6d.
(67) *Cement and Engineering News*, Chicago, Ill., 25c.
(68) *Mining Journal*, London, England, 6d.
(69) *Der Eisenbau*, Leipzig, Germany.
(71) *Journal*, Iron and Steel Inst., London, England.
(71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
(72) *American Machinist*, New York City, 15c.
(73) *Electrician*, London, England, 18c.
(74) *Transactions*, Inst. of Min. and Metal., London, England.
(75) *Proceedings*, Inst. of Mech. Engrs., London, England.
(76) *Brick*, Chicago, Ill., 10c.
(77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
(78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
(79) *Forscherarbeiten*, Vienna, Austria.
(80) *Tonindustrie Zeitung*, Berlin, Germany.
(81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
(82) *Mining and Engineering World*, Chicago, Ill., 10c.
(83) *Gas Age*, New York City, 15c.
(84) *Le Ciment*, Paris, France.
(85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
(86) *Engineering-Contracting*, Chicago, Ill., 10c.
(87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
(88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
(89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., $5.
(90) *Transactions*, Inst. of Naval Archts., London, England.
(91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
(92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
(93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
(94) *The Boiler Maker*, New York City, 10c.
(95) *International Marine Engineering*, New York City, 20c.
(96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
(98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
(99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, $2.
(100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
(101) *Metal Worker*, New York City, 10c.
(102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
(103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
(104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
(105) *Metallurgical and Chemical Engineering*, New York City, 25c.
(106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
(107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
(108) *Southern Machinery*, Atlanta, Ga., 10c.

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Field Girder Bridges.* G. E. Smith. (From *Royal Engineers' Journal.*) (100) Sept.
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Wanganui River Bridge. [New Zeal. C. & M. E.] (82) Aug.

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Les Ponts de Secours Faits de Solives sur le Canal de Canal à Tonnerre.* C. Boyrie. (30) Aug.

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Ponts de Wijnegem Brûlés et Provisoirement Rétablis.* L. Schoby and V. Lavie. (30) Août-Septembre 1931. 2 pl.

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Dielektrische Messungen an Kabeln. M. Klein. (41) Serial beginning July 24.
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The Adaptibility of Semi-Steel Mixtures. R. Hastings Probert. (Paper read before the Ohio Soc. of Mech., Elec and Steam Engrs.) (47) Aug. 22.
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The Critical Ranges of Pure Iron with Special Reference to the A2 Inversion.* H. C. H. Carpenter. (71) Vol. 87.
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Tests of Reinforced-Concrete Wall and Column Footings. A. N. Talbot. (Abstract of *Bulletin*, Eng. Exper. Station, Univ. of Ill.) (14) Aug. 2; (86) July 30.
Have Stirrups in a Reinforced Concrete Beam any Definite Value?* Edward Godfrey. (86) Aug. 6.
Design of the Steelwork and Methods and Cost of its Erection for an Armory having Long-Span Three-Hinged Arches.* (86) Aug. 6.
Results of some German Tests of Concrete Columns Reinforced with Cast-Iron and Spiral Reinforcement.* F. von Emperger. (Abstract from *Concrete and Constructional Engineering.*) (86) Aug. 6.
Underpinning the Old Mills Building, Broad and Nassau Streets, New York City.* (13) Aug. 7.
Damage to Bulk Cement and Sacked Cement by Wetting in Transit. J. H. Libberton. (13) Aug. 7.
Hoisting Heavy Girders 250 Ft. Above the Street.* (13) Aug. 7.
The Guaranty Trust Company's New Building, New York City.* Eugene W. Stern. (13) Aug. 7.
Bank Vault of the Guaranty Trust Company of New York City.* (13) Aug. 7.
Colouring Iron and Steel Products. E. F. Lake. (47) Aug. 8.
Long-Span Rolling-Mill Roof Truss.* (14) Aug. 9.
A Bonus System for the Purchase of Portland Cement. (13) Aug. 14.
Tests of a Fire-Resisting Paint.* (15) Aug. 15.
Collapse of a Reinforced-Concrete Frame in a Building, Vancouver, B. C.* A. P. Hueckel. (13) Aug. 14.
Enamel Brick.* George E. Walsh. (76) Aug. 15.
Hollow Block Stands Test.* (76) Aug. 15.
Tests of a Fire Resisting Paint.* (15) Aug. 15.
Load-Extension Diagrams Taken with the Optical Local-Extension Indicator.* W. E. Dalby. (Paper read before the Royal Soc.) (47) Aug. 15.
Underpinning and Retaining Grillage Foundations.* (14) Aug. 16.
Creosoted Wood Blocks for Factory and Warehouse Floors. F. A. Weaver. (14) Aug. 16.
Methods and Costs of Insulating Concrete Roofs Against Condensation.* Albert M. Wolf. (86) Aug. 20.
A Fire, Load and Water Test upon Cinder-Concrete, Terra-Cotta and Gypsum Floor Arches.* Harold Perrine. (13) Aug. 21; (46) Aug. 9.
Protecting Street Traffic from Falling Objects during Building Construction.* (13) Aug. 21.
A Cut Surface-Finish for Concrete.* (13) Aug. 21.
The New Building for the Bureau of Engraving and Printing.* Fred W. Lepper. (13) Aug. 21.
New Tensile Test Piece and Holder.* K. W. Zimmerschied. (20) Aug. 21.
Reverse Bending Moments in Fixed Beams.* Ewart S. Andrews. (12) Aug. 22.
Electrolytic Method of Preventing Corrosion. J. K. Clement and L. V. Walker. (Abstract of report to the Bureau of Mines.) (14) Aug. 23.
Methods Used for Underpinning Adjacent Buildings and for Constructing the Pneumatic Caisson Foundation of the 50 Broad Street Building, New York City.* F. E. Cudworth. (86) Aug. 27.
Dome of the Wisconsin Capitol.* (13) Aug. 28.
Machinery Hall, Panama-Pacific Exposition.* (14) Aug. 30.
Self-Supporting Concrete Towers and Novel Chute Supports.* (14) Aug. 30.
Reinforcing a Vibrating Floor.* (14) Aug. 30.
Excavation and Substructure Plant for the Equitable Building.* (14) Aug. 30.
Elasticimètre Enregistreur et son Application à l'Etude de la Valeur Industrielle des Caoutchoucs.* C. Chéneveau et F. Heim. (92) July.
Influence du Perçage sur la Résistance des Aciers Doux.* C. Birault. (33) July 19.
Fonte et Fonte Malléable.* W. H. Hatfield. (93) Aug.
Note sur le Damage Pneumatique du Béton.* M. R. T. Serrure. (30) Aug.
Sur la Dureté des Alliages Aluminium-Argent.* G. Le Grix et W. Broniewski. (93) Aug.
Die Jahrhunderthalle in Breslau.* Trauer. (51) Sup. No. 14.
Unrichtigkeiten über den Eisenbeton in physikalisch-chemischer und kolloid-chemischer Hinsicht.* P. Rohland. (48) June 28.
Die Kittlose Verglasung nach dem System Hein, Lehmann & Co.* Franz Czech. (69) July.
Der Zweigelenkrahmen mit Zwei Pendelstützen und Gleichen Feldweiten.* G. Kaufmann. (69) July.
Das städtische Krankenhaus von Berlin-Neukölln. Ph. Nitze. (40) July 12.
Gefüge des Flusseisens.* F. Märtens. (102) July 15.
Beitrag zur Untersuchung der Knickfestigkeit gegliederter Stäbe. Chr. Vlachos. (40) July 16.
Ueber einige Einwirkungen der Atmosphäre auf Bauten.* Vincenz Pollack. (53) July 18.

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Fabrikneubau der Konz. Elektrizitätsgesellschaft mit einhüftigen Rahmenbindern.* Dewitz. (78) July 19.
Frühbeetkästen aus Beton.* O. Hollmann. (80) July 19.
Die neuen Lehrerbildungsanstalten in Heilbronn und Rottweil.* v. Beger. (40) Serial beginning July 19.
Die Berechnung Doppelsymmetrischer Pfostenträger.* F. Wansleben. (69) Aug.
Die neuesten Versuche des österreichischen Eisenbetonausschusses und ihre Ergebnisse.* Fritz v. Emperger. (53) Serial beginning Aug. 1.
Zahlentafeln für Eisenbeton ihre Anwendung für 1 200 kg/qcm Eisenbeanspruchung. Weese. (80) Aug. 5.
Ueber die statische Berechnung von Eisenbetonfundamentplatten. H. Hövermann. (78) Aug. 6.
Die Ransome-Einheits-Bauweise.* Anton Fitzinger. (78) Aug. 6.
Die Berechnung der Bogendecken.* O. Domke. (78) Aug. 6.
Das neue Heizwerk der vorm. Gandenbergerschen Maschinenfabrik in Darmstadt.* Steinberger. (78) Aug. 6.
Ueber fugenlose Böden.* H. Werner. (51) Aug. 6.
Die Internationale Baufachausstellung Leipzig 1913.* (53) Aug. 15.

Topographical.

Method of Making and Recording Soundings in Topographical Survey of Spirit and Okaboji Lakes in Iowa.* (From *Bulletin No. 32,* Iowa Eng. Exper. Station.) (86) July 30.
Hydrographic Surveying; Oakland Harbor Development, California.* Fred W. Johnson. (13) Aug. 21.
Ueber den Gang der Okularröhre bei Nivellierinstrumenten.* A. Buchholtz. (52) June 30.

Water Supply.

Deep Well Pumps (Report of Comm., Am. Ry. Eng. Assoc.).* (85) Vol. 14.
An Experience with Water Ram. Charles W. Sherman. (28) June.
Water Ram in Distribution System, Hartford, Conn.* Caleb Mills Saville. (28) June.
Decarbonation as a Means of Removing the Corrosive Properties of Public Water Supplies.* George C. Whipple. (28) June.
Insulation of Joints in Pipe Lines.* William R. Conard. (28) June.
Quantitative Estimation of Ground Waters for Public Supplies. Myron L. Fuller. (28) June.
Leptomitus in Drinking Water. Robert C. Sweetser. (28) June.
Wise Utilization of Water Resources of Pennsylvania.* Morris Knowles, M. Am. Soc. C. E. (2) July.
Water Consumption and Rates in all Canadian Cities of 2 000 Population and Over. (86) July 30.
Notes on British Practice in Cleaning Water Mains. (86) July 30.
Arguments for and Against Charges for Private Fire Protection by Water Departments, with Special Reference to Conditions at Milwaukee, Wis. (86) July 30.
Experiments on Uplift Pressure in Masonry Dams.* C. R. Weidner. (13) July 31.
Venturi Meter Coefficients. Allen Hazen. (13) July 31.
Advantages of Meterage System.* A. J. O'Keefe. (60) Aug.
Centrifugal Pumps, Their Proper Selection and Use.* H. De Huff. (105) Aug.
Municipal Light and Water Plant at Fremont, Neb.* H. J. Bremers, Jr. (60) Aug.
Water Purification by Ozone. Russell Spalding. (9) Aug.
Tacoma's Nisqually River Development.* R. H. Richards. (27) Aug. 2.
Rolling Dam of the Boise Project.* Charles H. Paul. (14) Aug. 2.
Sterilizing Water with Ultra-Violet Rays, Description of New "Pistol" Light and its Applications in Large and Small Scale Plants.* M. von Recklinghausen. (14) Aug. 2; (13) Aug. 21.
Construction Camp at Arrowrock Dam.* Alfred B. Mayhew. (14) Aug. 2.
Tests of Pipe Joints.* A. J. Cleary. (14) Aug. 2.
Thermophones for Temperature Measurement in Dam. (14) Aug. 2.
Concrete Water Tanks for Industrial Plant.* (14) Aug. 2.
White River Hydroelectric Plant.* (14) Aug. 2.
Power from the Mississippi River.* (64) Aug. 5.
Method and Cost of Lining with Lead a Bridge Crossing of the Sudbury Aqueduct near Boston.* (86) Aug. 6.
The Effect of Micro-Organisms on the Operation of the Mechanical Filters at Louisville, Ky. Frederick H. Stover. (Abstract of paper read before the Am. Water Works Assoc.) (86) Aug. 6.
Snow Survey of Watershed, Meterage and Use of Auto Vehicles at Salt Lake City Water Works. (86) Aug. 6.
Notes on Water Works Construction and Operation in Chicago during 1912. (86) Aug. 6.

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The Effect of Proposed Storage Reservoirs on Stream Flow and Water Power on the Lower Chippewa River, Wisconsin.* Clinton B. Stewart. (13) Aug. 7.
Standard Specifications for Water-Works Hydrants and Valves. (13) Aug. 7.
The Ottawa River Storage Systems.* J. A. Macdonald. (96) Aug. 7.
The Use of Alum in Connection with Slow Sand Filtration at Washington, D. C.* William Firth Wells. (Abstract of paper read before the Am. Water Works Assoc.) (13) Aug. 7.
A Neglected Source of Power in Nature. Ben. J. Campbell. (13) Aug. 7.
The Murrumbidgee Irrigation Scheme in New South Wales. (29) Aug. 8.
Method for Designing Concrete Draft Tubes.* (14) Aug. 9.
Light-Iron Irrigation Flume.* (14) Aug. 9.
Construction of the Spaulding Dam.* (14) Aug. 9.
Permit for Development of Power on Pend d'Oreille River. (14) Aug. 9; (27) Aug. 16.
Reinforced Concrete Flume Construction Using Separately Molded Slabs and Separately Molded Slabs Combined with Slabs Molded in Place.* Smith L. Stovall. (Abstract from *Western Engineering.*) (86) Aug. 13.
Contractor's Plant and Construction Methods Employed in Building the New Water Supply and Storage Works at La Crosse, Wis.* (86) Aug. 13.
River Crossings for Water Mains at Fort William.* (96) Aug. 14.
Municipal Water Softening. Geo. A. Johnson. (96) Aug. 14.
Operation of the Mohawk River Bridge Dams.* D. A. Watt. (13) Aug. 14.
The Occurrence of the Fresh Water Alga (*Prasiola Crispa*) on Contact Beds and its Resemblance of the Green Seaweed (*Ulva Latissima*). E. A. Letts. (Abstract of paper read before the Royal Sanitary Inst.) (104) Aug. 15.
Rapid Pump and Pipe-Line Installation at San Diego. (14) Aug. 16.
Flow over Model of Sunol Dam.* Joseph N. Le Conte. (14) Aug. 16.
A Triple-Plunger Artesian Well Pump.* W. M. Fleming. (62) Aug. 18.
Auxiliary Deep-Well Water-Supply with Electric Pumps.* (13) Aug. 21.
The Cost of Reclamation Service and other Irrigation Projects in Colorado. John E. Field. (13) Aug. 21.
The Turbines of the Mississippi River Power Co. at Keokuk, Ia.* (13) Aug. 21.
The Turbine Runners of the Mississippi River Power Co. at Keokuk, Iowa.* H. B. McDermid. (13) Aug. 21.
The Application of Ultra-Violet Rays for Purifying Large Quantities of Water.* Max von Recklinghausen. (13) Aug. 21.
Irrigation of Santa Cruz Valley.* M. C. Hinderlider, M. Am. Soc. C. E. (14) Serial beginning Aug. 23.
The San Francisquito Power Station No. 1.* (14) Aug. 23.
Tidal Waters as a Source of Power.* C. A. Battiscombe. (From *Journal,* Soc. of Engrs.) (19) Aug. 23.
The Economics of Pipe Line Diameters.* C. W. Harris. (Abstract of paper read before the Pacific Northwest Soc. of Engrs.) (86) Aug. 27.
Data on the Cost of Pumping in Water Works Steam Pumping Stations.* Kenneth F. Lees. (Paper read before the Conn. Soc. Civ. Engrs.) (86) Aug. 27.
The Tor Hill Reservoir, Regina.* R. O. Wynne-Roberts, M. Inst. C. E. (96) Aug. 28.
Bringing an Old Water-Works Valuation up to Date. William E. Butt. (13) Aug. 28.
Efficiency of Coagulating Basins at St. Louis, Mo.* W. F. Monfort. (Abstract of paper read before the Ill. Water Supply Assoc.) (13) Aug. 28.
Formulæ for Weights of Cast Tees and Crosses (for San Francisco Auxiliary Water Supply).* (14) Aug. 30.
Barrages à Chute Fractionnée, Système Rutenberg. (Tr. from *Il Cemento.*) (84) Serial beginning July.
Usine Hydro-Electrique, de 300 000 Chevaux, de Keokuk sur le Mississippi (Iowa, Etats-Unis).* P. Calfas. (33) July 26.
Alimentation en Eau Potable des Hauts Quartiers de la Ville de Bourg (Ain).* Marcel Elsner. (33) Aug. 9.
La Commande Electrique des Grandes Vannes.* H. Gil. (33) Aug. 16.
Die neue Pumpmaschinenanlage der Stadt Pforzheim.* Hans Falk. (48) June 21.
Vornahme von Versickerungsversuchen zur künstlichen Erzeugung von Grundwasser auf dem Wasserwerk Müggelsee. (7) July 12.
Die Möhnetalsperre.* Link. (40) Serial beginning July 19.
Verschluss bei den Grundablässen der Waldecker Talsperre.* Sympher. (40) Aug. 6.
Die Möhnetalsperre und die Entwicklung des Talsperrenwesens im Ruhrgebiet.* (51) Serial beginning Aug. 20.

Waterways.

Failure of Coffer at Lock and Dam No. 48, Ohio River.* J. C. Oakes. (13) July 31; (14) Aug. 2; (100) Sept.

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Waterways.

Waterways—(Continued).

A Dipper Dredge with Hydraulic Jets for Leveling the Spoil Banks.* Chester B. Loomis. (13) July 31.
The Port of Hamburg.* I. F. Bubendey. (13) July 31.
The Barge Canal Crossing of Oak Orchard Creek, Medina, N. Y.* Noble E. Whitford. (13) July 31.
Laying Sand Bags and Anchoring Track (Bank Protection).* E. G. Lang. (87) Aug.
How to Increase Marine Terminal Capacity. H. McL. Harding. (95) Aug.
The Chain Fenders for the Panama Canal.* (20) Aug. 7.
Surveys and Estimates for Proposed Black River Canal.* (14) Aug. 9.
Reconstruction of a Timber Crib Dock at Erie, Pennsylvania. (14) Aug. 9.
The Use of a Plank or Lumber Apron Mat for Shore Protections on the Upper Mississippi River.* Charles W. Durham. (86) Aug. 13.
Records and Cost of Work of Dipper Dredges Operated by the United States Engineers in River and Harbor Improvements, 1911-12. (86) Aug. 13.
Timber Buffers for Protecting Vessels Entering the Panama Canal Locks.* (Abstract from *Canal Record.*) (13) Aug. 14.
The Control of River Floods. C. McD. Townsend, M. Am. Soc. C. E. (Paper read before the Drainage Comm. at St. Louis.) (96) Aug. 14.
Prize Design for Coney Island Beach Reclamation.* (13) Aug. 14.
The New Welland Ship Canal.* (96) Aug. 21.
A Large Reinforced-Concrete Culvert, Newcastle, Eng.* (13) Aug. 21.
Taking the Temperature of the Sea.* (12) Aug. 22.
Report on Weir in the Niagara River.* (14) Aug. 23.
Electric Service in Connection with the Cape Cod Canal.* (27) Aug. 23.
Harbor Development in Seattle, General Outline of Six Projects being Undertaken by the Port Commission.* William L. Kidston. (14) Aug. 23.
Equipment and Performance of the British Columbia Dredging Fleet, Operating Costs for Five Different Types of Dredges and Auxiliary Plant, with a Discussion of Causes of Delay.* (14) Aug. 23.
Making Panama Lock Gates Watertight.* (From *Canal Record.*) (62) Aug. 25.
Seepage Losses from Earth Canals.* E. A. Moritz. (13) Aug. 28.
The Truth about the Culebra Cut Slides, Panama Canal.* A. S. Zinn. (13) Aug. 28.
Sliding Ground in Culebra Cut. Donald F. MacDonald. (13) Aug. 28.
Chicago Harbor and Subway Plans. (13) Aug. 28.
An Electric Hydraulic Dredge.* (13) Aug. 28.
Pneumatic Caissons for Scotia Dam.* (14) Aug. 30.
Rebuilding Jetties at Humboldt Bay, California.* Morton L. Tower, M. Am. Soc. C. E. (100) Sept.
Rock Drilling Tuscumbia Bar, Tennessee River.* J. E. Hall. (100) Sept.
Pros and Cons on the Forest and Flood Question.* Thomas P. Roberts, M. Am. Soc. C. E. (100) Sept.
Que Faut-il Faire de Zeebrugge? C-J. Van Mierlo. (31) Pt. 2.
La Seine Maritime et le Port de Rouen.* L. Sekutowicz. (33) July 26.
Der Grossschiffahrtweg Berlin-Stettin.* Mattern. (49) Pt. 7.
Grundwassersenkungs-und Betonierungsanlagen beim Bau von Schleppzugschleusen im Emsabstieg des Dortmund-Ems-Kanals.* Zimmermann. (49) Pt. 7.
Ausbau des Sakrow-Paretzer Kanals.* Artur Schmidt. (40) July 16.
Neuere Messmethoden zur Bestimmung von Wassermengen auf Grund von Versuchen der Schweizerischen Landeshydrographie.* W. Zuppinger. (107) July 26.
Betriebsergebnisse von Baggerarbeiten. (40) July 30.
Der Rhein-Maas-Schelde-Kanal von Crefeld nach Antwerpen.* Ign. Pollak. (53) Aug. 1.
Die Segmentschützen der neuen Stimmingsarche in Brandenburg a. d. Havel.* Ostmann. (40) Aug. 13.

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